

We claim:

1. A water filtration device for removing dissolved metals from a dilute aqueous stream, comprising
 - a packed bed filter;
 - an influent pipe for conveying a dilute aqueous stream to said packed bed filter; and
 - an injection port for injection of a chemical solution into said influent line; wherein said packed bed filter, said influent pipe and said injection port are arranged so that no substantial amount of particulate matter will settle from said dilute aqueous stream between said injection port and said packed bed filter.
2. The device of Claim 1, wherein said packed bed filter comprises a bed of sand.
3. The device of Claim 1, wherein said packed bed filter is a dual-media filter.
4. A method for removing dissolved contaminants from a dilute aqueous stream, comprising the steps of
 - adding a hydrolysable compound of a metal to said dilute aqueous stream;
 - co-precipitating a hydrolyzed compound of said metal and said contaminants from said dilute aqueous stream, thereby forming a co-precipitate; and
 - filtering said co-precipitate from the dilute aqueous stream,wherein said filtering step is performed concurrently with said co-precipitating steps, and wherein said method is performed so that no substantial

amount of particulate matter settles from the dilute aqueous stream before the start of said filtering step.

5. The method of Claim 4, wherein said filtering step is performed using a packed bed filter.

6. The method of Claim 5, wherein said adding step is performed less than seven minutes before the completion of said filtering step.

7. The method of Claim 6, wherein said adding step includes injecting a solution of ferric iron into the dilute aqueous stream.

8. The method of Claim 7, wherein the dilute aqueous stream contains arsenite, said method further comprising the step of adding to said dilute aqueous stream a chemical oxidant for oxidizing arsenite to arsenate before the start of said filtering step.

9. The method of Claim 1, wherein said hydrolysable compound of a metal comprises a compound selected from the group consisting of ferric chloride, ferric sulfate, ferrous sulfate, aluminum sulfate, aluminum chloride, titanium sulfate, and titanium chloride.

10. The method of Claim 1, wherein the dilute aqueous stream contains a dissolved substance selected from the group consisting of aluminum, antimony, arsenic(III), arsenic(V), barium, cadmium, cesium, chromium, cobalt, copper, gallium, gold, iron, lead, manganese, mercury, molybdenum, nickel, platinum, radium, selenium, silver, strontium, tellurium, tin, tungsten, uranium, vanadium, zinc, fluoride, nitrite, phosphate, sulfite, sulfide, and a low-molecular weight organic arsenic compound.